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PERFORMANCE MEASUREMENT OF FOREIGN OPERATIONS  
UNDER FLOATING EXCHANGE RATES

David J Sharp

WP 1393 - 83

DECEMBER 1982

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I would like to record my thanks for the support and advice of my advisers, Professors Donald Lessard and Richard Robinson; to Professor Peter Brownell, the 'outside reader'; and for the helpful comments of Professor H. David Sherman and of my fellow students of International Management; Bruce Kogut's advice was especially helpful. I also record my appreciation to Professor Vinod Bavishi, Director of the Center for Transnational Accounting and Financial Research, University of Connecticut, for generously providing data processing facilities and making data available for this study.

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"OBJECTIVES OF TRANSLATION

- a. To provide information that is generally compatible with the economic effects of a rate change on an enterprise's cash flows and equity
- b. To present the consolidated financial statements of an enterprise in conformity with US generally accepted accounting principles...."

Statement of Financial Accounting Standards No. 52  
Foreign Currency Translation, December 1981.

## INTRODUCTION

One of the problems facing the managers of corporations with overseas subsidiaries which distinguish them from their uninational colleagues is that a large proportion of corporate activity is undertaken within different monetary jurisdictions; specifically, foreign subsidiaries earn income denominated in different currencies. For the purpose of preparing consolidated quarterly published accounting statements, as required by the Securities and Exchange Commission (SEC), rules have to be devised to translate these foreign currency (FC) accounting statements into local currency (LC), i.e. US dollars.

In December 1981, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards No. 52: Foreign Currency Translation (FAS 52), which replaced an earlier statement FAS 8: Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements.

FAS 8 had been issued in 1976 in order to replace the variety of previously acceptable methods of accounting for foreign income with one uniform standard. The historic-rate translation method of FAS 8 treated foreign income as if it had occurred in dollars. It also required that all translation gains and losses be recorded in current income, thereby producing net income figures which

i. were as uncontrollably volatile as exchange rates

ii. included large foreign currency gains and losses which bore no relationship to so-called "real economic" effects of foreign exchange movements.

As soon as the business community recognised the effects of FAS 8 on reported earnings, pressure was brought to bear on FASB to revise the standard; not so much, one suspects, because FAS 8 income was different from "economic reality", but because managers had little control over the huge effect of unpredictable exchange rates on reported earnings. (To be sure, submissions from the business community were frequently couched in terms of the lack of credibility which FAS 8 had brought upon the accounting profession, and the unrealistic nature of net income figures.) FAS 52 has therefore been welcomed by the business community and the profession (1). We will see that FAS 8 generally produced unbiased income numbers which had a high variance, while FAS 52 produces relatively stable income figures, but at the expense of a bias created by the interaction of historic cost accounting rules and differential inflation between domestic and overseas currencies. The avowed intent of FAS 52 to represent economic reality is likely to endow translated dollar income figures with high credibility, and lead to their increased use as a basis for management performance. For this reason, we evaluate FAS 52 from a performance measurement and control perspective. It turns out that the bias in net income is potentially large, and since internal control systems are already largely based on translation rules for external accounting requirements, decisions concerning resource allocation across national boundaries may be made incorrectly after the adoption of FAS 52.

This paper is in four main sections. In the first, we review the current understanding of the behavior of foreign exchange rates. We show that exchange rates, inflation and interest rates are inseparably linked in foreign exchange markets. In the light of this, the literature on the accounting treatment of foreign exchange is reviewed, and is found generally not to be consistent with the economic literature.

The second section critically examines the practice of accounting for foreign operations as required by FAS 52 and US generally accepted accounting principles (GAAP). We do this by developing a normative basis for performance measurement, against which FAS 52 is compared. The long-run effects of FAS 52 are examined in the context of long-run expectations in foreign exchange markets, and are found to cause a bias to net income and return on investment (ROI) prepared under the historic cost (HC) convention of US GAAP and FAS 52. This bias was not present under FAS 8. We show that an inflation-adjusted accounting standard would remove this bias. The short run effects of FAS 52, while not significantly different from those of FAS 8, are found to misrepresent foreign exchange gains and losses. Again, we find that an appropriate treatment is possible if accounting statements are inflation-adjusted. The requirement of GAAP to state monetary assets and liabilities at nominal value, not discounted net present value, is shown also to lead to inconsistent treatment of otherwise identical transactions in different currencies.

In the third section, we test whether control systems in use in US

multinationals are designed in such a way that they encourage non-optimal decisions, and whether managers are aware of this. We find that reward systems in a disturbingly high number of multinational corporations potentially encourage non-optimal behavior, but there appears to be some awareness of the problem.

The final section discusses the need for more objective reported accounts, and the importance of the role of the accounting profession in setting such standards.

FAS 8 was a historic-cost oriented standard; by translating at historic exchange rates, foreign accounting statements were consistent with US dollar statements produced under the historic cost convention. The all-current translation method of FAS 52, however, is conceptually inseparable from inflation-adjusted accounting, and cannot be expected to produce sensible information otherwise.. FAS 52 has a few critics, including three of the committee of seven who drafted it. (FAS 52, p.15). Their criticism (that FAS 52 is an unacceptably large departure from the HC principles of GAAP) it seems to me, is misguided; it should be directed instead at the much greater problem of the relevance of US GAAP, and specifically historic cost accounting.

#### THE ECONOMIC ENVIRONMENT OF INTERNATIONAL ACCOUNTING - A REVIEW

In this section, we review the literature on the behavior of exchange rates in a floating-rate world such as has been the case since

Smithsonian parities were abandoned in 1973. We find the following fundamental relationships:

i. In the long run, purchasing power parity (a goods market model) and the International Fisher Effect together suggest relationships between differential inflation, differential interest rates, and exchange rate movements.

ii. In the short run, exchange rates behave like financial assets in an efficient market, with the result that expectations play the dominant role in determining short-run exchange rate movements.

It would seem reasonable then that accounting rules for translating into dollars economic activity which is measured in foreign currency should be built on a foundation which recognises these fundamental relationships.

An exchange rate is simply the price of foreign currency in terms of local currency. Like any other price, it is determined in a market which may be more or less free of controls and imperfections. On the one hand, the exchange rates of centrally planned economies are fixed entirely by government fiat, while on the other, exchange rates between the US dollar and, for example, major European currencies are determined in large, well-organised markets free from controls, in which publicly available information is rapidly disseminated, and which therefore correspond closely to a semi-strong form efficient securities market (2). We consider here only the efficient-market case, though we mention

briefly the important implications of inefficiency.

Purchasing Power Parity (PPP) has enjoyed a long and successful history as the long-run determinant of exchange rates. Briefly, PPP states that exchange rates tend to move in such a way that the relative purchasing power of all currencies is unchanged; that is, nominal exchange rate movements will be in proportion to relative inflation.

The term was first coined by Cassel (1916), and the voluminous subsequent literature is summarised in Balassa (1964) and Officer (1976). They also point out that there are reasons why exchange rates might not tend exactly towards PPP (owing to relative differences in productivity in traded and non-traded sectors between the high-income technologically-advanced and low-income countries, for example). Such reservations notwithstanding, this paper takes Krugman's (1978) point of view:

"Few international economists would deny that purchasing power parity holds in some sufficiently long run..."

The analysis that follows is based on the view that PPP represents an 'ideal' situation, and that deviations from PPP are temporary aberrations which, although they are obviously short-term equilibrium rates, nevertheless distort translated accounting statements, since statements are translated at actual exchange rates, and not at some hypothetical rate based on ex post differential inflation.

What are these short-term deviations? Krugman's next sentence:

"But most [international economists] would probably be skeptical of



any assertion that PPP holds in the short run."

Since the ending of Smithsonian parities in February 1973, exchange rates have been highly volatile, and more or less unpredictable. In that respect, they behave, not as prices of goods and services, but as prices of financial assets. The primary determinant of price movements is therefore expectations, and as information arrives in essentially a random manner, exchange rates should also move in a random manner. Giddy and Dufey (1975) showed that the behavior of exchange rates between a number of major currencies was not significantly different from a random walk or martingale. Frenkel (1981) took this further demonstrating the importance of information (i.e. news). He showed that a strong relationship existed between unanticipated exchange rate movements and unanticipated movements in interest rates (a variable which was expected to capture the effect of 'news' very quickly).

Dornbusch (1980) proposes an asset model of exchange rates which elegantly explains that the high volatility of exchange rates arises because changed expectations about future interest rates and inflation cause the exchange rate immediately to overshoot the long-run equilibrium rate, and only slowly to return to it.

However, there also exists a strong relationship between the spot exchange rate and the forward rate in the short run; the difference between these rates is determined by the powerful covered arbitrage transaction between differential risk-free interest rates in different currencies. The forward rate thus always represents that exchange rate



which can be guaranteed by hedging in forward markets. But is the forward rate an unbiased predictor of the spot rate? Giddy and Dufey above assumed that it was, and found that this submartingale model of exchange rate behavior was also statistically significant, and in fact, that the martingale and submartingale models produced virtually identical results.

It is not clear that the forward rate is an unbiased predictor of the future spot rate, since holders of FC financial assets would require a risk premium if the expected cash flows (i.e. exchange rates) were correlated with security market movements (3). The literature on theoretical reasons why such a risk premium should exist is thoroughly reviewed by Henriksson and Lessard (1982). Empirically, Hansen and Hodrick (1980) have demonstrated the existence of either market inefficiency or a small risk premium, but in common with all studies of this type, it is not possible to test separately the validity of the model and market efficiency. A rather pragmatic test of market efficiency is whether, ex post, so-called experts at forecasting were able to outperform the market. Levich (1981, 1982), and Henriksson and Lessard (1982) have both found that some forecasters can consistently outperform the market over the period studied for some currencies, but by and large, the major currency markets are indeed at least weak-form efficient most of the time.

The link between the long-run and the short-run is made via the International Fisher Effect (IFE), which states that the difference between the current spot rate and the expected value of the future spot

rate equals the difference in interest rates. Giddy (1977) showed that this relationship held quite well for one-year interest rates, but less so for very short-term rates. Furthermore, the (domestic) Fisher Effect states that the nominal rate of interest equals the real rate of interest plus the rate of inflation. Fama (1975) showed that, at least for the US dollar, short term interest rates incorporate inflation expectations well. If capital markets are perfectly integrated, expected real interest rates should be equal for all currencies.

To summarise so far, we see a relationship between inflation, exchange rates and interest rates. In the long run, exchange rate movements tend to follow PPP, but in the short run, they are highly volatile as adjustments in expectations are incorporated simultaneously into interest rates, and forward and spot exchange rates. In the absence of deviations from PPP, expected real interest rates in all currencies are equal. Forward rates are probably the best estimates of the expected future spot rates, albeit poor ones. Finally, covered interest arbitrage ensures that the difference in nominal riskless interest rates is exactly reflected in the difference between the forward and the spot rate.

The literature on the application of this theory to accounting for international operations is of two types. Those who write from a financial background have concentrated on the relevance of hedging; Logue and Oldfield (1977) for example clearly view hedging as a zero-NPV transaction, and therefore irrelevant as far as the value of the firm is concerned, though they also take the view that accounting performance

(at that time under FAS 8) did not matter. Giddy (1976) clarifies the distinction between hedging and speculation, but he does not discuss the misleading accounting treatment of hedging. Other financial writers discuss the appropriate measure of exposure; Dufey (1972) in a brief descriptive but insightful article points out the importance of cash-flow exposure but was unable to relate this to a specific standard of accounting for exposure, since none existed at that time. Few writers have specifically examined the impact of accounting practice on foreign income measurement. Fredrikson's (1968) must surely rank as the clearest analysis of the confusion created by accounting practice for foreign exchange transaction losses, in spite of the fact that he too had no accounting standard to which to refer; nor was he able to use subsequent developments in the theory of accounting for inflation. Aliber and Stickney (1973) present an empirical analysis of the validity of PPP and the International Fisher Effect, but were not able to incorporate their findings into specific implications for reported accounting (again, a standard did not exist at the time).

Those writing from an accounting perspective on the other hand, have frequently emphasised the effect of exchange rate movements without a complete consideration of the behavior of those exchange rates. Contrary to most of the polemic generated by FAS 8, Mueller (1976) took the view that FAS 8 was no better or worse than any other standard, but he also recognised that the real need was for an inflation-adjusted standard. Shank (1976) pointed out that one result of FAS 8 would be that reported earnings would be more volatile than had formerly been the case (though Rodriguez (1977) was unable to verify this empirically).

Shank's view was confirmed when the parity of the dollar subsequently fluctuated wildly against other (especially European) currencies. (See for example Curran (1981) and Alleman (1982).) The inconsistent accounting treatment of transaction gains and losses, and the similar treatment of the results of the translation process (both of which are discussed below) continue to divert many writers' attention from the real issues; Prindl (1974), Evans, Folks and Jilling (1978), Czechowicz, Choi and Bavishi (1982). The interrelationship of exchange rates and inflation has been discussed in terms of the "restate-translate vs. translate-restate controversy", but without reference to exchange rate behavior, by Lorensen and Rosenfield (1974), while Choi (1977) recognises that under an inflation-adjusted accounting standard, the issue is trivial; which indeed it is, but only if PPP holds.

This paper seeks to present a comprehensive critique of current multinational accounting practice in the US. We now examine the relevant accounting rules and principles .

## ACCOUNTING FOR THE RESULTS OF FOREIGN SUBSIDIARIES

### 1. Background

Annual audited accounts are published by corporations in order to convey information to shareholders; the main reasons for this are stewardship and accountability. Audited statements are the means by which

shareholders are assured that directors (and by implication, all other employees) are performing their fiduciary duties correctly. The objective is to disclose specific information prescribed by a strictly defined set of rules, US GAAP, which originally evolved in a one-country context, but have had to be adapted to a multinational environment as the need arose. Three well-known fundamental principles lie behind the formal financial accounting rules: objectivity, consistency and conservatism. There have always been problems of compromise between these three and a fourth principle, that of relevance, but the advent of multinational accounting has made the problem acute. In addition to GAAP, FAS 52 is a specific statement (which purports to be consistent with the more general guidelines of GAAP) of how to account for foreign operations. Since 1971, the international economic environment has become less stable, less predictable and arguably less well understood while multinational corporations have spread their operations throughout the world. Small wonder, then, that accounting for multinational operations has experienced such growing pains.

A further problem confounding the measurement of results of foreign operations is that the strategic view of overseas subsidiaries varies from one corporation to another, and even between subsidiaries within the same corporation. A subsidiary may be part of a tightly-controlled, highly integrated worldwide system, or completely autonomous and self-sufficient; at the same time, parent objectives might be to maximise dividend repatriation, or to consolidate and build market share, with no immediate expectation of dividends at all. These are serious issues, and cannot lightly be dismissed, but they are also



applicable to large diversified domestic corporations. Our attention here is focussed specifically on those problems which are currency-related, and multinational in content.

A study of accounting-based control systems for use in US corporations with overseas operations raises two problems which do not have exact counterparts in the purely domestic case. The first problem, which is the subject of detailed discussion in this paper, is that the reporting system should correctly identify a cost item both by nature (an expense labelled "foreign exchange loss" should exclusively be the result of unforeseen exchange rate movements, for example) and by responsibility, which in its simplest form raises the centralisation / decentralisation issue: if exposure management is to be a centralised treasury function - the most common and most efficient organisation - then the speculative (unforeseen) component of foreign exchange gain or loss has to be attributed to the treasury function, whose responsibility it is to hedge the company's overall foreign currency exposure against such unforeseen losses. (It is true that the treasury may also be responsible for taking speculative positions where they have better knowledge of, or access to, imperfect or controlled markets.) The expected component of exchange gain or loss, meanwhile, should be attributed to subsidiary operating management, so that they are motivated to incorporate those expectations into operating decisions. As will be seen, the conventional accounting treatment of foreign exchange gains and losses does not enable this important distinction between the expected and the unexpected gain or loss to be made.

The second problem is more subtle, and is discussed only briefly here. The fact that exchange rates and relative prices (among other variables) do change means that the standard against which performance is judged (i.e. a budget) should also be changed to reflect uncontrollable changes in the business environment. An appropriate control system then is one which measures actual against standard, given a particular uncontrollable state of the world.

These two problems can be illustrated by an example. Suppose that the currency of the foreign subsidiary depreciates by more than would be required to maintain purchasing power parity. Such an exchange rate movement is entirely plausible if, for example, a newly elected government announced an expansionary monetary policy to reduce unemployment and increase output. A result of problem 1 is that exchange gains or losses may arise which are likely to be attributed incorrectly to the subsidiary. The currency depreciation, outside the control of the subsidiary manager, will certainly result in lower translated dollar operating income, even if the subsidiary fully incorporates local inflation into its prices. These are the issues we discuss in this paper. A result of problem 2 is that since exchange rates have moved in an unexpected way, the competitiveness of the overseas (and, for that matter, domestic) operations has changed, so that the assumptions upon which the budget was based have become invalid (Lessard (1982)). Control systems then should not only separate anticipated and surprise elements of exchange losses, and allocate them correctly, but should also recognise that as a result of the 'over-depreciation' of foreign currency (in this example), the

subsidiary has become more competitive in world markets, and the overseas operating manager should be judged against a revised standard.(4)

Even though published accounting information does not claim to represent a true picture of the economic performance of an entity, nevertheless the two are closely related. Furthermore, the accounting information is prepared under a well-understood set of professional rules. It is only natural then that published accounts should have acquired widespread credibility, and that managers - the stewards of the shareholders assets - should rightly be concerned that the only objective (and published) measure of their performance appear as favorable as possible. It can be argued that they can develop their own separate measures of the true economic performance for internal use, or that they at least use local currency accounts for evaluation purposes. Research by Czechowicz, Choi and Bavishi (1982) does not support this view; a US dollar perspective, translated under published-accounting rules, is most commonly used (5).

An accounting standard for financial reporting of overseas operations could be based on one of several conflicting objectives. In 1976, FASB issued the controversial Statement No. 8 which defined rules which had as their objective to measure foreign subsidiary activity as if it had been conducted in dollars under US GAAP. The essential features of FAS 8 were that fixed assets and inventories were translated at the exchange rate on the date of their acquisition (thereby showing those asset values and depreciation on a constant basis, just as they would have been in the US under GAAP), while liabilities and current monetary



assets were translated at the exchange rate on the balance sheet date (the current rate). Revenues and expenses were translated at an appropriate average rate for the period. By far the most controversial aspect of FAS 8 was that the inevitable "plug" balancing figure resulting from this translation (infelicitously known as a translation gain or loss) be included in consolidated net income. The results of FAS 8 translation were that

- i. for a typical subsidiary located outside the US financed by equity and foreign debt, whose currency devalued relative to the dollar, a large "translation gain" arose, and conversely, when the dollar weakened, a loss arose.

- ii. this gain or loss, recorded within net income, could swamp all other operating income and thereby seriously distort the measurement of the true income of the entity.

- iii. although the extent to which these gains and losses actually corresponded to real economic gains and losses arising from exchange rate movements was unclear to many managers, they were nevertheless concerned about them, and were tempted to take hedging positions in order to reduce the volatility of reported earnings.

- iv. because depreciation and cost of goods sold were translated at the historic rate, they appear exactly as if they had been located in the US. These expense items were therefore understated by the same amount that an identical US expense would have been; i.e.,

translated foreign income statements were biased by the effect of US, rather than foreign, inflation.

A second, relevant but regrettably (as we show later) less controversial, item within consolidated net income is "transaction gains or loss". This arises when a monetary FC-denominated asset or liability is created in LC books at one date, and is extinguished at a later date after the exchange rate has changed. The difference between the book debt or asset (valued at the spot rate at the date of creation) and the amount of LC needed to extinguish it at the spot rate on the date of settlement is treated as a transaction gain or loss in the current period.

In December 1981, FAS 8 was replaced with FAS 52. The new standard is required for all published statements starting with the 1983 financial year, but may be introduced earlier (and many firms have chosen to incorporate it into the 1981 accounts). The purpose of FAS 52 is very different from that of its predecessor, since its stated main objective is to provide information generally compatible with the expected economic effects of a rate change on an enterprise's cash flows and equity, while presenting consolidated statements in conformity with US GAAP (p.3)

The mechanics of FAS 52 may be summarised as follows. All assets and liabilities are translated at the current rate. Revenues and expenses, including depreciation, are translated at an appropriate average rate for the period, but the "plug" number is taken directly to a reserve,

and so does not form part of the period's net income. The treatment of transaction gains and losses is unchanged from FAS 8, except in respect of the treatment of gains and losses arising from a carefully defined range of hedging transactions, which may be deferred instead of being reported in income. An additional feature of FAS 52 is that translation is to be made into dollars from the "functional currency" of the subsidiary; this functional currency is simply the currency of the primary economic environment in which the entity operates (p.25), which is typically, but not necessarily, the currency of the country in which the subsidiary is located. It should be noted in passing that where accounting records are kept in a currency which is not the functional currency, the translation is in two stages:

- i. remeasurement from the currency of the books to the functional currency

- ii. translation from the functional currency to the US dollar.

The remeasurement process is based on historic exchange rates (in practice very similar to the former FAS 8 requirements for translation into dollars), and it follows therefore that where the functional currency is the dollar, and subsidiary books are maintained in local currency, FAS 52 accounting results are substantially identical to those which would have been produced under FAS 8.

This paper is not concerned with the theoretical issues of the difference between accounting and economic measures of income, nor with

the arguments over the most appropriate manner by which conventional accounts should be modified in order to show "current cost" or "current purchasing power" net income. The problem of which indicator of inflation to use is also sidestepped; the rate of inflation implied in the discussion which follows is that rate which satisfies PPP in the long run (6). We will accept that accounts prepared under GAAP in the absence of inflation represent an "unbiased" measure of net income (even though we know that the principle of conservatism will in fact generally lower than the reported income figure).

As used in this paper, 'historic cost' accounting refers to the accounting method whereby tangible assets are recorded at the time of acquisition at cost, and expensed (either as depreciation or cost of goods sold) without any adjustment being made for the fact that:

- the purchasing power of the numeraire (currency) of the expense has been reduced by inflation
- the replacement cost of the asset at the time it is expensed differs from the cost at acquisition (for whatever reason; inflation is only one of many possible reasons)

The two adjustments above represent the two approaches to the restatement of historic cost accounting statements to adjust for inflation which are presently used in the experimental inflation accounting standard FAS 33 (7). Two separate adjustments to net income are required to be shown in footnotes; a general price level adjustment

(GPLA) based on the CPI, and a current cost adjustment (CCA) based on price indices of the firms' specific assets.

I will show below that the absence of an inflation adjustment causes operating income to be overstated. In this paper, I take the view that this bias can be completely removed by any appropriate, comprehensive adjustment for inflation (i.e. GPLA or CCA), though in general, of course, these two methods will produce different adjusted net income. However, since the long run movement of exchange rates reflects changes in relative purchasing power, it is the GPLA (rather than the CCA) adjustment of FAS 33 which is conceptually more consistent with expected long run exchange rate movements.

Before we discuss the accounting treatment of specific performance measures, it is useful to set out two desiderata of any performance measure to be used across currencies:

First, the measure should be unbiased with respect to functional currency, that is, the measure should not consistently overstate or understate performance in any one currency.

Second, the measure, when applied to a foreign subsidiary, should be a reasonable measure of economic performance, that is, the application of FAS 52 and GAAP to the measurement of foreign performance should produce an indicator which is no worse a misrepresentation of economic reality and the results of managerial decisions than the corresponding measure of domestic activity.

The two economic variables which potentially distort reported performance are the rate of inflation and the exchange rate. No discussion of accounting for foreign operations can make any sense until three basic facts are addressed:

- i. in the long run, nominal exchange rate movements reflect relative purchasing power, i.e. inflation
- ii. historic cost accounting assumes that inflation does not exist
- iii. in the short run, exchange rates are highly volatile and deviate substantially from PPP (8).

The bias to reported net income caused by inflation can be separated into three elements:

- i. Costs (in particular, depreciation and cost of goods sold) and revenues in the same income statement are not measured in the same numeraire (units of purchasing power)
- ii. Non-interest-bearing assets and liabilities (i.e., monetary working capital) lose purchasing power, and therefore create a gain or loss which is not captured by the accounts.
- iii. Interest-bearing monetary assets and liabilities show the same effect, though this may be offset by interest income or expense. (The accounting treatment is nevertheless incorrect,



since most of so-called interest expense is effectively repayment of capital, and interest income the maintenance of capital.

We now separately examine the consequences of the first two items. The reason for the omission of the third is not that it is inconsequential (indeed, the effect of debt on real taxes paid has arguably the greatest impact on real corporate performance), but because financing decisions are invariably made at the corporate level, and therefore financing effects are not incorporated into subsidiary performance measures. In any case, financing effects are easily separable from operating performance, and amenable to independent analysis.

In section 2 below, we examine the effect of mismeasurement of depreciation and cost of goods sold on the two most commonly used measures of foreign subsidiary performance: return on investment and net income (9). In section 3, we examine those two maligned and misunderstood accounting numbers unique to foreign activities, transaction and translation "losses" (10). In the course of this, we demonstrate the inconsistency of GAAP and historic cost in the accounting treatment of monetary working capital, and suggest a more appropriate one. In order to reduce the complexity and diversity of multinational activity to a tractable level, we concentrate on the comparative results of a hypothetical US corporation comprising two identical, self-contained corporate entities, one located in the US and reporting in dollars, the other located in a foreign country, and preparing its accounts in that country's currency, which is its functional currency for the purposes of FAS 52.

## 2. The Measurement of Operating Performance

As is well known, HC accounting overstates net income because:

- i. depreciation expense is understated relative to the current cost of the asset
- ii. cost of goods sold is understated relative to the replacement cost at the time of sale.

Return on investment is further overstated in that not only is the numerator overstated, but the denominator is understated:

- i. book value of fixed assets is at lower historic cost
- ii. inventories are understated relative to current cost.

The really troublesome feature of HC accounting is that it is not possible to predict the amount of this inflation bias on net income from the HC accounting statements; 10% inflation might result in net income being overstated by 5% in one firm and 50% in another; it depends on the age of individual assets of each firm. Empirically, the adjustments shown in the published footnotes have been large; a reduction of 50% is typical, and in some cases, net income has been reduced to a loss.

The experimental inflation accounting standard FAS 33 was issued in 1979. It requires that the effects of inflation on net income be shown



in the footnotes of the annual reports. An important point is that FAS 33 is still experimental; accountants and analysts are only slowly beginning to understand the significance of the adjustments. The facts that they are controversial, experimental, reduce profit substantially, that two published versions of an inflation adjustment (GPLA and CCA) can produce very different adjusted net income, and that they are only footnotes all conspire to render the credibility of inflation-adjusted accounts very low.

We now examine a number of inflation/exchange rate scenarios in which our simple two-country corporation might prepare its accounts, and their impact on reported earnings.

#### 1: PPP HOLDS AT ALL TIMES, WITH HC ACCOUNTING IN BOTH COUNTRIES

Under the historic cost principles of GAAP incorporated into FAS 52, inflation causes income to be overstated in the currency of the accounting statements, and the greater the inflation, the greater the distortion. However, the movement of the exchange rates may in some cases partially compensate for this effect. Consider the extreme case where foreign inflation is positive, while domestic inflation is zero. Domestic HC accounts are unbiased, while foreign profits in the LC are overstated, and this overstatement is present to a reduced extent in the translated accounts, because the translation accurately reflects the reduced purchasing power of the foreign profits, but cannot compensate for the HC-induced distortion.

In general, it can be shown (Appendix A) that for all positive values of inflation, foreign HC income translated using an appropriate average exchange rate is unambiguously overstated relative to real income measured in end-of-period purchasing power, but may be understated or overstated relative to the US HC accounts.

For identical entities, the HC results can be summarised:

$I_f < I_d$	$I_f > I_d$
Foreign Income understated	Foreign Income overstated

where  $I_f$  is foreign inflation, and  $I_d$  is domestic (i.e. US) inflation.

Thus in those countries where inflation is greater than that of the US (but not highly inflationary, see scenario 3), foreign subsidiaries appear to do better than their identical US counterparts, and vice versa. It should be noted that this result does not hold if a comparison is being made between non-similar entities.

## 2: AS 1 ABOVE, BUT PPP HOLDS ONLY IN THE LONG RUN

This is the real world situation at present, where historic costs are still the "accepted principle". All we can say now is that the expected bias is as stated above, but that actual reported performance may turn out to be understated or overstated, depending on the actual exchange rates prevailing during the period. Furthermore, since actual exchange rates are typically very volatile, the variance around the expected bias

will be large. Worse still, it is not even possible ex post to determine whether net income is over- or understated without knowledge of its sensitivity to inflation adjustments.

For identical entities, the HC results can be summarised:

$I_f < I_d$ Foreign Income is expected to be understated	$I_f > I_d$ Foreign Income is expected to be overstated
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It should be noted that this result also is not true for non-similar entities.

### 3: THE HIGHLY INFLATIONARY ENVIRONMENT

The previous analyses are only valid if the foreign country does not have a "highly inflationary environment", defined in FAS 52 as a cumulative inflation rate of 100% over three years (equivalent to 26% p.a.). For the accounts of a subsidiary in a highly inflationary country, FAS 52 requires that the US dollar be defined as the functional currency, thereby effectively reverting to FAS 8 treatment. The effect, it will be recalled, is that foreign net income is overstated to the same extent as US net income. If PPP holds in the short run, the overseas results will look very like those in the US, but since the reality is that exchange rates are volatile (especially those of a highly inflationary country, unless the government is exceptionally good

at controlling the rate), we can look forward to a reported net income figure which is unbiased, but very unpredictable indeed.

At the present time, FASB is preparing an amendment to its standard for inflation accounting, since the present standard is incompatible with FAS 52 (10). It is therefore appropriate to examine the implications of an accounting standard which integrates the interrelated issues of foreign currency translation and worldwide inflation, in the hope that the problems facing the design and implementation of such a standard will eventually be overcome.

#### 4: PPP HOLDS AT ALL TIMES, AND WORLDWIDE ACCOUNTS ARE INFLATION ADJUSTED

The results can be stated easily. Performance measures are unbiased, and the results remain unbiased through translation. In addition, asset/equity values, restated to adjust for local inflation, and translated at the current exchange rate, are exactly equivalent to the domestic assets restated for domestic inflation (Appendix B). Foreign translated accounts are therefore unbiased, both for the purposes of measuring performance relative to domestic accounts, and in absolute economic terms. Furthermore, the distinction between highly inflationary economies and others does not need to be made. Finally, such an accounting standard produces unbiased results regardless of whether inflation is higher in the US or overseas; indeed deflation is handled just as easily (in the unlikely event that this should be needed).

### 5: AS No. 4, BUT PPP HOLDS ONLY IN THE LONG RUN

This situation corresponds to the real world with accounting principles which recognise the reality of inflation. Since both domestic and

foreign accounts are unbiased, all that matters is whether movement of the exchange rate has compensated for relative loss of purchasing power. This is readily ascertained simply by comparing the average differential inflation with the average change in exchange rates used to restate and translate the foreign currency accounts.

These are the only possibilities:

<p>Appreciation &lt; relative deflation or depreciation &gt; relative inflation</p> <p>Foreign performance is understated</p>	<p>Appreciation &gt; relative deflation or depreciation &lt; relative inflation</p> <p>Foreign performance is overstated</p>
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The analysis does not depend on a knowledge of the capital and expense structure of the firm; it depends only on observable inflation and exchange rates, thereby, incidentally, allowing better financial analysis of published statements.

### 3. The Measurement of Foreign Exchange Gains and Losses

A foreign exchange loss (see footnote 8) may be said to occur if, as the

result of the movement in exchange rates, the value of the firm measured in dollars is reduced. Accounting identifies two types of such loss:

- i. Transaction losses, which arise for example when contractual assets or liabilities are denominated in a foreign currency, recorded in the books at the time of acquisition in domestic currency at the spot exchange rate, and subsequently extinguished at a different rate.
- ii. Translation adjustments, which arise only in the consolidation process; since net income is translated at an average exchange rate, all assets and liabilities at the current rate, and equity is translated at a historic rate, a 'plug' number is required to make the dollar balance sheet balance; if the plug is a dr., it is known as a loss, while a cr. is a gain(11).

There are two general problems with the accounting treatment of foreign currency related gains and losses. First, gains and losses are generated which may have no economic meaning. An example of this occurs when a foreign currency depreciates, resulting in a lower dollar value of fixed assets. This is recorded (under FAS 52) as a translation 'loss' (though in a reserve, not through the income statement), yet it is unlikely that the firm has suffered any economic loss which has reduced shareholders' equity. Second, real operating gains and losses which arise from changed competitiveness are not identified; such losses are typically buried within changes in gross margins and sales volumes, and cannot be determined accurately. Also excluded are



off-balance-sheet losses which arise from fixed FC contractual obligations not recognised as liabilities under GAAP (e.g. order backlog, contracts).

Transaction losses are misleading because the objectivity requirement of HC accounting requires monetary assets and liabilities to be valued at historic cost. A dollar receivable due, say, in three months is recorded at its nominal, not discounted, value. Since the actual number of dollars subsequently received is the same as the number contracted, the effect of inflation is invisible. Not so with the foreign currency receivable. GAAP require that the nominal FC asset or liability be recorded at the spot rate on the transaction date. The exchange gain or loss is defined as the difference between this and the dollar amount subsequently received at the later settlement date. No distinction is made between the actual amount received and the expected amount to be received (which is the contracted amount translated at the appropriate forward rate on the transaction date). If the FC amount is booked at the forward rate on the transaction date, however, then the accounting FC-related gain or loss includes only the unexpected component, while the expected component would automatically be included where it belongs - in operating margins.

The problem arises because GAAP do not recognise the change in the purchasing power of monetary assets and liabilities. Differential inflation between currencies is expected (in the long run) to be reflected in the movement of exchange rates, and is thereby recognised by the accounting system not as an inflationary gain or loss, but as a

foreign exchange loss. In practice, though, we must consider short-run behavior, and short-run currency movements are determined not by expected inflation, but by interest rates (even though, according to the Fisher Effect, these are determined by expected inflation in any case). A strict interpretation of the expected foreign exchange loss is that it is the foregone differential interest income on the foreign receivable. Likewise, an expected foreign exchange gain is the reduced loss of interest from holding a nominal receivable in a currency with paradoxically a lower nominal (but the same real) interest rate. Let it be stated clearly: hedging does not reduce foreign exchange gains and losses; rather it guarantees that the gain or loss will be the expected value defined above. The expected loss is unchanged by hedging; it is the uncertainty around that loss which is reduced by appropriate hedging, and of course increased by inappropriate hedging.

In perfect markets, hedging involves only trivial transaction costs (in real terms); the apparent cost that appears in the accounting system as a foreign exchange transactions loss was actually incurred at the time the decision was made to grant credit in a foreign currency, and is presumably a marketing cost (Fredrikson). So in just the same way as domestic operating management should incorporate expected domestic inflation into pricing decisions such that the desired real revenue is actually achieved at the time of final payment, so should foreign management incorporate expectations about foreign inflation (or strictly speaking, foregone interest). It is therefore inappropriate to incorporate the total amount of transaction gains and losses in a measure of subsidiary management operating performance. The expected



part of the gain or loss is a marketing expense resulting strictly from foregone interest (but implicitly the loss of purchasing power for which the nominal interest would have been compensation), and should be identified as such. Unforeseen gains and losses on the other hand only arise when a position is unhedged; they are truly speculative (or the result of unforeseen exposure), and are rightfully the responsibility of the treasury function. It also follows that any decision not to hedge, or to selectively hedge, is always speculation against the collective information of the foreign exchange market; unfortunately, GAAP do not enable managers to separate the effects of prudence from the effects of speculation.

To be consistent, it follows that domestic receivables and payables, and the corresponding revenue and expense items, should also be discounted to reflect the loss of purchasing power of the receivable between the date of recognition of the revenue and the subsequent collection of the receivable. Since the loss of purchasing power during the expected payment delay (i.e., normal terms of trade) should have been incorporated into the price in the first place, the foregone interest for this period is correctly a reduction in the value of the sale, attributable to the marketing function. Any additional collection delay, however, is the responsibility of the credit control department (the treasury function). This suggests an internal control system in which the inflationary loss in purchasing power resulting from holding accounts receivable (in any currency) is separated into an expected component (based on interest rates and forward exchange rates for the expected collection period) and residual gains and losses which arise

from undue delays in collection and unhedged unexpected movements in exchange rates and interest rates.

At this point, it is appropriate to consider the situation where an exchange market is not semi-strong efficient, either because the firm has better information than the foreign exchange market, the market is very thin, or government restrictions on the mobility of capital create arbitrage opportunities for corporations which have the infrastructure in place to exploit them. In such a situation, it is entirely reasonable that the treasury function might take advantage of the situation and undertake transactions with expected positive NPV. However, without the separation of expected and speculative returns, measurement of the success of such speculation is misleading. The expected component of a transaction gain or loss has a place in inflation-adjusted accounting, since it is simply a part of the gain or loss of purchasing power which arises from holding a net monetary position.

Translation losses are more obviously misleading, and therefore less frequently misunderstood. A firm only holds non interest-bearing monetary assets in a period of inflation because it cannot avoid doing so; it is a necessary part of doing business. Conversely, monetary liabilities are held to the greatest extent practicable in order to gain purchasing power (or tax advantages). But the firm holds non-monetary assets usually in order to derive cash flows from their future use. This is equally true of inventory and fixed assets. (An exception would be where an asset is held for speculative reasons; its nominal value

would be expected to increase faster than the rate of inflation). The true currency-related gain or loss related to such assets is not determined at all by their cost as shown in the accounts, but instead by the dollar net present value of the future cash flows that they are expected to generate. Such cash flows are a function of market structure (whether competitors' costs and prices are sensitive to exchange rate movements, for example), and are more correctly designated "operating exposure". In general, it is impossible to state whether the operating exposure of a business unit is long or short without an analysis of the sensitivity of its costs and revenues (from an accounting perspective, translation exposure of assets is long by definition). So any rule of thumb which encourages the netting of so-called balance sheet exposure (essentially non-monetary assets against debt) is meaningless in general, and can only make sense if the operating exposure defined above equals the "non-monetary- asset" exposure. Likewise, true inventory exposure is really incorporated in the exposure of the expected sales revenue to be generated from that inventory; any measure of inventory exposure which incorporates the cost of inventory (or the cost of any other fixed asset for that matter) is simply falling foul of the well-known "sunk cost fallacy". Inventory and fixed assets are sunk costs; to be sure, we have to state a value for them for accounting purposes, but we must not be led into thinking that the book value of a foreign asset has any more economic reality than the book value of a domestic one.

#### 4. Disclosure

Operating exposure can only be very approximately measured, both ex ante (the financial perspective) and ex post (the accounting perspective). Balance sheets also have to balance, so there will always be a "translation plug number". However, it is misleading to label it "gain" or "loss", and its correct place is in the reserves section of the balance sheet. In the interests of better management decision-making (not to mention adequacy of disclosure) it would seem reasonable to require a currency-by-currency statement of operating exposure; even a qualitative footnote that exposure was long, short, or immaterial would be an enormous step in the direction of better shareholder information. Shank and Shamis (1979) have suggested that transaction gains and losses be disaggregated by major currency, but a more useful additional disaggregation would distinguish between expected and unexpected amounts, ideally with the expected portion reported along with interest income and expense, as part of the monetary/purchasing power gain or loss. The remainder, which is the result of unhedged, unexpected exchange movements, then is truly a foreign exchange loss. In the fully hedged firm, its value would be zero (hedges of operating exposure would be netted (but disclosed) against the corresponding revenue items); its actual value truly is the ex post cost or gain of speculation.

## THE RESEARCH

### 1. Introduction

The purpose of this study is to verify:

i. that multinational control systems are consistent with maximising shareholder wealth, rather than accounting profit or some other measure of managers' utility;

ii. that if they are inconsistent, managers perceive this inconsistency;

iii. that if managers perceive this inconsistency, they are dissatisfied with it; alternatively they are satisfied with their performance measures and are therefore unlikely to change them.

Managers maximise shareholders' wealth by undertaking on their behalf non-negative-NPV transactions. Now foreign investment is not simply a once-for-all decision; rather, it is an on-going process of expansion by profit retention and new capital injection. To the extent that the expectation of uncertain future cash flows is colored by actual experience of similar cash flows from existing investments, unprofitable investments may be undertaken in those countries where measured performance is biased upwards relative to the US or other subsidiaries, and profitable ones rejected where measured performance is biased downwards. At the very least performance evaluation systems will be dysfunctional. A performance evaluation system should therefore be unbiased.

This study uses data which was originally collected in a study of the practice of overseas performance evaluation in large multinational corporations. We investigate the appropriateness of control systems (as

the respondents describe them) relative to the normative approach described above. We also test respondents' individual awareness of the implications of the change from FAS 8 to FAS 52 on operating performance measurement, and finally, whether respondents were aware of the dysfunctionality of their firms' control systems where they have (perhaps unknowingly) reported its potential existence.

## 2. Sample and Methodology

This study uses data collected in a postal questionnaire survey of large multinational corporations, supplemented with some interviews, during 1980. The survey was carried out for Business International Corporation by I. Czechowicz, F. Choi and V. Bavishi. For this study, I have used the raw survey data at the Center for Transnational Accounting and Financial Research, University of Connecticut, to test the hypotheses below. Three hundred questionnaires were sent to US and non-US companies; eighty-eight (29%) were returned, of which the sixty-four from US multinationals form the sample under investigation. Since potential sources of non-response bias are not known, the results may not be generalisable to all large multinational corporations. The size distribution of the sample studied here is given below:

Fortune rank (summer 1980)	Number in sample
1 - 100	30
101 - 200	21
201 - 300	12
unknown	1



The sample was widely diversified among industries, with some preponderance towards the chemical industry (seven firms). Fifty-six of the sixty-four individual respondents were Manager/Director of Financial Planning and Analysis, CFO, Financial Controller, Assistant Controller or similar title; six of the rest had general international responsibility.

### 3. Hypotheses and Results

The control systems of the sixty-four large US multinationals in the sample studied here are HC oriented. Only one respondent stated that an inflation adjustment was made to the measure of overseas performance, while 35 respondents stated that inflation adjustments were not calculated at all, and 28 respondents did not answer the question. This is not inconsistent with answers to another question in which it was stated that HC was used in 51 firms for fixed asset valuation, and 44 firms for inventory valuation for the purposes of calculating the denominator in ROA and similar indicators. It does however illustrate the caution which must be exercised in drawing conclusions from any questionnaire-based data of this nature.

At the time of the survey, FAS 8 was the required accounting standard, but the first draft of what was later to become FAS 52 had recently been issued. (The major difference between this draft and the final version of FAS 52 was that the first version contained no provision for highly inflationary economies.) Answers to the questionnaire therefore relate to FAS 8 accounting rules; however, it should be recalled that



i. FAS 8 accounts are prepared under the historic cost convention, and therefore incorporate the same underlying bias of any HC accounts

ii. The inflation bias in foreign reported income is that arising from US inflation, not foreign inflation

iii. The variance of reported earnings was typically much higher than under FAS 52, and no exchange-related gains or losses could be deferred.

One of the few things that could be said in favour of FAS 8 was that since it preserved a dollar perspective, it also preserved in translated foreign accounts the bias due to dollar inflation in respect of depreciation expense and cost of goods sold. Translation gains and losses aside, net income was unbiased relative to historic cost net income of the domestic corporation. What of the "translation gain or loss" item? Under FAS 8, it is the result of the appreciation or depreciation of foreign debt. Since this is a monetary nominal liability, strict purchasing power parity considerations would lead us to the conclusion that the perceived expected gain or loss would depend on relative inflation; if foreign inflation is greater than in the US, foreign subsidiaries would show in the long term a translation gain (while the correspondingly high interest expense would be much less visible of course). In practice though the PPP effect would be masked by the high volatility of the actual exchange rate, so that virtually none of the trend would be visible.

HYPOTHESIS 1(a)

A firm may use a performance evaluation system which is based on the translation method required for external reporting (with its embedded faults and advantages), or it may use any other method appropriate for its own particular business. We have seen that FAS 8 produced unbiased (though highly variable income figures, while FAS 52 income will be biased. We have no a priori reason to expect managers whose firms have 'home-grown' translation methods to make changes to them as a result of the introduction of FAS 52 (unless perhaps accounting numbers per se are a management objective). The real issue is that those performance evaluation systems which are based on external translation methods will have to be changed; not just because the external method has changed, but because the new translation method produces biased income under historic cost rules, and historic cost income is invariably the basis for performance evaluation.

HYPOTHESIS 1(a): Firms which used a FAS 8 basis for translating for internal reporting should anticipate altering that basis upon implementation of FAS 52.

Respondents were asked whether the translation method used for internal evaluation differed from that used for external reporting by the parent. Another question asked whether the proposed changes to FAS 8 would have any affect on how the company evaluates or plans to evaluate overseas operations. The analysis of the 59 responses to the questions is shown in Table 1 below:

		External and internal translation methods are the same                  different		
The proposed change to FAS 8	Would affect performance evaluation	19 (44%)	7 (44%)	
	Would have little effect on perf. evaln.	24 (56%)	9 (56%)	
Total		43 (73%)	16 (27%)	59

TABLE 1

We note first that as many as 43 (73%) of the respondents stated that their firms used the same method of translation for internal evaluation as FAS 8 required for external reporting. Of more concern though is that as many as 56% of those 43 respondents did not perceive a need to change. Coincidentally, among those other firms which had developed alternative translation measures, the same proportion expected to make changes upon implementation of FAS 52. This is perhaps less surprising than at first might appear, since the most likely candidate for an alternative method would be the substitution of current rate for historic for the translation of inventory, (though we have no means of verifying this), which would also need to be changed under FAS 52.

It could be argued that the proposed FAS 52 had, at the time of the survey, only recently been made public. Hence, the respondents may not have had time to to consider thoroughly its implications. We make two observations. First, the companies in the sample were some of the largest and presumably most sophisticated anywhere. We are entitled to

expect the respondents at least to have been conversant with the proposals. Second, FAS 8 had been in effect four years at the time, and was almost universally disliked for its highly erratic impact on earnings. This alone should have been sufficient encouragement for a multinational to modify internal evaluation systems had they so wished.

#### HYPOTHESES 1(b) and (c)

A control system should discourage the inappropriate hedging of fictitious exposure (since this would increase the variance of earnings while incurring transaction costs); it should therefore not create incentives for the hedging of exposures by local managers (since an exposure at the local level might disappear in the overall portfolio perspective at the corporate level). The inclusion of translation and transaction gains and losses in managers' evaluation encourages them to hedge such a loss. In addition, we have already noted the fallacy of accounting measures of transaction gains and losses as a true measure of currency gains and losses. However, even though we have no information about the inclusion of cash flow exposure into performance measurement (since no questions were asked on this subject), we can state that the inclusion of transaction and translation gains and losses, as measured by GAAP rules, is dysfunctional.

HYPOTHESES 1(b) and 1(c): Transaction (b) and translation (c) gains and losses are not included in the performance evaluation of the overseas subsidiary manager.

Respondents were asked whether transaction and translation gains and losses were incorporated in the performance measure of the overseas unit; transaction losses were separated into intercompany (excluded here, since there is an ambiguity of responsibility for them) and gains/losses with third parties. The number of firms which include such gains and losses is shown in Table 2 below.

Transaction gains/losses	Translation gains/losses
35(55%)	24(38%)

TABLE 2

Source: Czechowicz, Choi, and Bavishi, page 166.

Both these accounting numbers incorporate expected and unexpected components of foreign exchange loss. It will be recalled that the expected gain or loss is typically small relative to the unexpected component. The expected percentages are therefore zero in both categories. We see, therefore, that the potential for inappropriate hedging decisions exists in a large proportion of the respondents' companies.

#### HYPOTHESIS 2(a)

The second issue is whether managers perceive the inadequacy of existing control systems in respect of foreign exchange risk management, and therefore the need to change them. A fundamental issue is that the true

exposure of the firm is not a function of the accounting system which measures it. The change from FAS 8 to FAS 52 should therefore affect in no way the concern that managers may have for foreign exchange gains and losses.

HYPOTHESIS 2(a): Managers recognise that the change from FAS 8 to FAS 52 will have no impact on the exposure of the firm.

Respondents were asked whether they thought that the proposed replacement of FAS 8 would make management concern over translation gains and losses unnecessary. Thirteen (20%) of the respondents agreed that this was the case, (Czechowicz, Choi and Bavishi, p.167) thereby indicating a lack of understanding of the nature of exposure, or perhaps more kindly, a concern for accounting numbers.

#### HYPOTHESES 2(b) and 2(c)

It was stated earlier that there are indeed sound pragmatic reasons why managers should show concern for what is published, as well as the economic fundamentals of the business. However, if managers truly are aware of the misleading nature of such accounting measures, then they should recognise that the inclusion of accounting measures of currency gains and losses into measured performance should lead to increased incidence of overseas managers making decisions not in the interest of the firm's shareholders.

HYPOTHESES 2(b) and (c): In those corporations where foreign



exchange gains and losses arising from transactions (b) and translation (c) are included in managers' performance evaluation, respondents will report a higher incidence of decisions taken by overseas managers which are not in the best interest of the firm as a whole.

Respondents were asked whether they had found that the performance evaluation system encouraged overseas managers to take action not in the best interest of the company as a whole. Two specific examples of such action were cited in the question, viz. disposal of useful assets to increase reported ROI, and taking expensive or unnecessary hedging action. Table 3 below shows the number of respondents who stated that they thought that the control system did encourage inappropriate decisions by subsidiary managers.

		Transaction gains/losses included in evaluation?		Translation gains/losses included in evaluation?	
		yes	no	yes	no
Control system encourages poor decisions?	yes	6(18%)	3(10%)	4(17%)	5(13%)
	no	28(82%)	26(90%)	20(83%)	34(87%)
Total		34	29	24	40

TABLE 3

Since the actual number of such firms is very small, little reliability can be placed on the statistics. However, the fact that only nine respondents perceive the potential for dysfunctional decision making is itself an indication that managers seem to be unaware of the problem,



even when the possible outcome (i.e. unnecessary hedging) is pointed out in the question.

### HYPOTHESES 3(a) and 3(b)

The binary (yes/no) nature of the answer to the question above leaves no room for judgement by the respondent on the overall suitability of the control system. A further question asked for a rating, on a three point scale, of the performance evaluation system.

HYPOTHESES 3(a) and (b): Respondents from companies in which foreign exchange transaction (a) and translation (b) gains and losses are included in performance evaluation should show a lower level of satisfaction with the performance evaluation system.

Respondents were asked to express on a three-point scale their overall satisfaction with the way the system evaluated overseas managers. Since the alternatives were "very satisfied", "moderately satisfied" and "not satisfied", the problem of the small numbers in Table 3 may be avoided. As an approximate measure of the satisfaction level in each column, an index of satisfaction for the group was calculated by assigning a value +1 for each "very satisfied" response, 0 for "moderately satisfied" and -1 for "not satisfied". However, owing to the unreliability of the data (in particular, non-response bias), I do not think that a formal test of significance would have any meaning. The results are shown in Table 4 below.

	Transaction gains/losses included in evaluation?		Translation gains/losses included in evaluation?	
	yes	no	yes	no
very satisfied	9(26%)	10(38%)	7(29%)	12(33%)
moderately satisfied	22(65%)	14(54%)	15(63%)	21(58%)
not satisfied	3(9%)	2(8%)	2(8%)	3(9%)
Total	34	26	24	36
Satisfaction Index	+6	+8	+5	+9

TABLE 4

As can be seen, there is a slightly greater feeling of dissatisfaction among those respondents whose overseas managers were held responsible for exchange losses.

An interesting issue which was also checked was whether these feelings were the same in respect of the evaluation of overseas units, rather than their managers. Since separate questions in respect of both exchange losses and perceived satisfaction were asked in respect of the evaluation of overseas units, this is possible. The results are shown in Table 5.

	Transaction gains/losses included in evaluation?		Translation gains/losses included in evaluation?	
	yes	no	yes	no
very satisfied	17(36%)	9(56%)	16(44%)	10(37%)
moderately satisfied	27(57%)	7(44%)	17(47%)	17(63%)
not satisfied	3(7%)	0	3(9%)	0
Total	47	16	36	27
Satisfaction index	+14	+9	+13	+10

TABLE 5

We note a small but consistent reversal of satisfaction, indicating perhaps that respondents felt the overseas units should have foreign exchange gains and losses attributed to them.

## CONCLUSIONS

The overall conclusion from this study is that although present performance systems in many large corporations leave much to be desired, there is some small indication that the respondents were aware of the shortcomings of their own systems.

This study suffers from the usual problems of secondary data; the questions asked were not the ones that answer directly the problems discussed in this paper. The most useful additional information would be in relation to operating exposure, i.e. the nature of the subsidiaries' products and markets, and government or other controls (especially on prices) under which they operate. Indeed, one could

question the validity of any data such as these which are based on the aggregation of all subsidiary activity, when in practice subsidiaries and products may be so diverse that the aggregation process probably causes most of the interesting product by product and subsidiary by subsidiary data to be lost.

We have seen that large US corporations operating internationally are generally HC-oriented, and that control systems are largely geared towards the requirements of the FASB and the SEC, even though such requirements may be inconsistent with economic reality. As many as half of the large multinationals have adopted FAS 52 for their 1981 accounts, two years before they were required to do so. This rapturous welcome is less a reflection of the merits of FAS 52, but rather a result of the demerits of its predecessor FAS 8.

FAS 52 is a current-cost oriented approach to translation, and in a world of reasonably stable exchange rates moving in response to PPP, and with an inflation-adjusted accounting standard, it would indeed be a standard which achieved its stated objectives. It fails for two reasons. First, accounts are prepared under the HC convention, while the use of an all-current rate for translation automatically incorporates in the long run the expected inflation adjustment in the movement of the exchange rate. Second, exchange rates are highly volatile in the short run, and in effect, a somewhat arbitrary value (that on the date of the financial year end) is used to translate foreign balance sheets. An exchange rate used for translation actually incorporates two elements: the differential inflation since the

previous statements, and a random element which causes income to be understated or overstated relative to that change in relative purchasing power. We have shown that only with inflation-adjusted accounts will it be possible to identify the direction of that bias.

With accounts prepared under the HC convention, there is an unpredictable distortion of the two most commonly used performance measures, net income and ROI. As long as an inflation-adjusted standard is not incorporated into reported income, managers are unlikely to reward performance and allocate resources across nations in an economically consistent manner. A change of emphasis is needed in the accounting profession from objectivity towards relevance. The necessity to maintain the integrity of published accounts has spawned the "supplementary statements" which shed more light on what is impeccably objective from an auditing perspective, but actually misleading. Reported accounts must be adjusted for inflation. This has been achieved in many other countries, and in spite of the complexity of the issues, it should also be possible to prepare objective, verifiable accounts in the US too. For the adjustments to be credible, the accounts themselves, not footnotes, must be changed.

As long as HC remains the basis of reported accounts, and the alternative inflation-adjusted net income remains only in the footnotes, it will lack credibility not only among its readers, but most importantly among the managers of the firm, those who allocate scarce resources and are rewarded on the basis of the results. Inflation adjusted accounting will never achieve respectability, nor managers make

efficient decisions, until the financial press, securities analysts and shareholders use inflation-adjusted information as a matter of course, and historic cost statements are relegated to the obscurity of the footnotes.

This study has shown once again that managers are concerned with reported numbers. It is right that they should be so. The stewardship function of audited accounts would be failing if they did otherwise. But the role of the public accounting profession, and the rules it makes for the preparation of audited accounts, is not limited to the sense of prevention of defalcation of assets; those rules also guide decision-makers in the allocation of shareholders' resources. That this function rightfully be part of the definition of good stewardship is surely the strongest case that can be made for relevant, inflation-adjusted annual accounts. The accounting profession therefore has a duty to implement inflation-adjusted accounting at the earliest opportunity.

## FOOTNOTES

1. See for example, the comments of any of the 'big 8' accounting firms.
2. Under the efficient market hypothesis, in a weak-form efficient market, prices cannot be predicted from past performance, in a semi-strong form efficient market, prices incorporate all publicly available information, and in a strong-form efficient market, prices incorporate all information.
3. The problem here is that a (systematic) risk premium has to be defined with respect to a particular securities market. Conceptually that could be the US market, a consumption-weighted market, or even the world market.
4. This contingency approach in a budgeting context is a generalisation of the 'flexible budgeting' technique. Budgeted revenues and costs are a function of volume sold, which in turn is a function of (uncontrollable) relative price movements of inputs and outputs created by deviations from purchasing power parity. For the firm dealing with a highly differentiated product in one country, the latter effect could be small. However, for any firm, (not necessarily with overseas operations even) dealing in a more price-sensitive, internationally competitive environment, the relative prices of currencies has considerable impact



on expected profitability. A contingent budget in such circumstances is a very appropriate basis for a control system.

5. The study by Czechowicz et al. found these results for US multinationals:

Currency perspective	ROI	Budgeting
US dollar	55%	41%
local currency	6%	13%
both currencies	34%	45%

6. For a discussion of this issue, see K. Macharzina and A. Coenenberg, 'Current Cost or Current Purchasing Power Accounts? An Internationally-based Assessment of FASB Statement 33 on Financial Reporting and Changing Prices' International Journal of Accounting 16 Spring 1981.

7. FAS 33: Financial Reporting and Changing Prices, September 1979, and its proposed amendments vis a vis FAS 52 incorporated in an Exposure Draft of December 1981.

8. It is therefore quite remarkable that FASB should suggest in their proposed amendment to FAS 33 that where an index of foreign inflation is not available, an alternative may be "to assume that there is a direct and opposite relationship between (a) the change in the relative purchasing power of a functional currency and the US dollar and (b) the

change in the exchange rate for those currencies" i.e. that PPP holds in the short run, thereby imparting the volatility of exchange rates to relative inflation.

9. The Czechowicz et al. study ascertained the relative importance of a number of measures of performance on a scale of 1 to 4. The highest score was 1.5 for budget net income vs. actual, the second highest score was 1.8 for ROI. (The next most important measure, return on sales, scored 2.2).

10. Of course, there could equally well be gains; however, there can be no doubt that the concern of managers other than professional currency dealers is to minimise losses rather than to maximise gains. See Rodriguez (1979) p.31 or Robbins and Stobaugh (1973) p.120.

11. Although FAS 52 correctly calls this a translation adjustment, not loss, for simplicity, we use the term 'loss' for a dr. adjustment and 'gain' for a cr. adjustment.

12. FASB recognised the problem of inefficient decision-making in their introduction to FAS 33. However, they probably underestimate the extent of the credibility embedded in HC statements.

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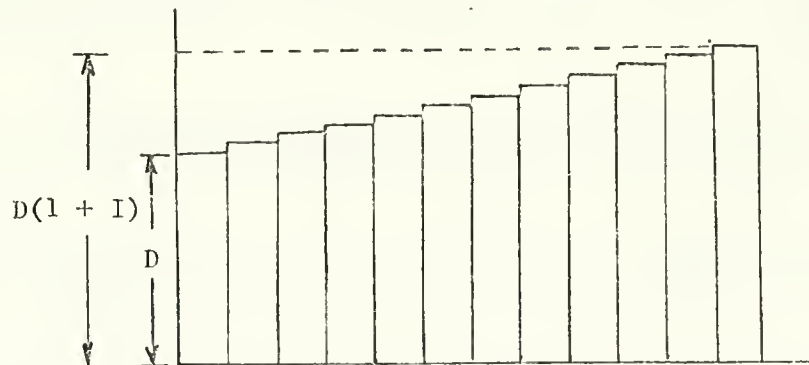
## APPENDIX A

Consider an overseas company with a depreciation expense  $D$  units of local currency, with book value of assets  $A$  at the start of the accounting period when the spot exchange rate is  $S_0$  (direct quote, the dollar price of FC). The identical US company therefore has an identical depreciation expense  $\$ D.S_0$ . Assume also that cost of goods sold maintains its real value except for the lag induced by the inventory valuation process, and all other revenues and expenses maintain their real value.

### 1. GPLA Inflation Adjustments

Translation of revenues and expenses takes place temporally, i.e. foreign income (revenue less expense) is recognised in dollars at the same time that GAAP recognise the local income in local currency.

For simplicity, consider the case of linear inflation. The current cost at the time the expense is recorded has to reflect inflation to date. The pattern of depreciation expense therefore approximates to



Clearly, if the average inflation factor which appears to have been applied to the HC inflation expense  $D$  is  $(1 + i)$ , this is half of the overall inflation  $(1 + I)$  during the period.

At the end of the accounting period, all expenses are required to be stated in terms of period-end purchasing power. The depreciation expense must be stated in purchasing power after inflation  $I$ , and is therefore  $D(1 + I)$ . We may derive the relationship between  $(1 + i)$  and  $(1 + I)$  in two ways:

Exact method: restate each sub-period's expense and sum them

Suppose we divide the accounting period into a large number ( $n$ ) of short sub-periods. Let inflation to date in sub-period  $j$  be  $i_j$ , and the HC depreciation expense for sub-period  $j$  be  $d_j$  (where  $\sum d_j = D$ ). The depreciation expense as recorded in each sub-period is therefore  $d_j(1 + i_j)$  in terms of sub-period  $j$  purchasing power. At the end of the accounting period, each has to be restated to end of period purchasing power by a factor corresponding to the inflation  $I - i_j$  which took place between the sub-period and the end of the accounting period, i.e., the restated expense is



$$= d_j(1 + I + Ii_j - i_j^2) \frac{d_j(1 + i_j)(1 + I - i_j)}{d_j(1 + I + Ii_j - i_j^2)}$$
 which approximates to  $d_j(1 + I)$  if  $I, i_j \ll 1$ .  
(Note: this derivation does not require the assumption of linear inflation.)

Approximate method: use average rates of inflation for the whole period.

The HC depreciation expense  $D$  for the period had been adjusted by an average inflation factor  $(1 + i)$  applied to the whole period expense: the expense appears therefore as  $D(1 + i)$ . This can be restated to end-of-year purchasing power by adjusting again by the same factor  $(1 + i)$ . The adjusted expense is therefore  $D(1 + i)(1 + i) = D(1 + 2i + i^2)$ . Since  $I \doteq 2i$  and if  $i \ll 1$ , then this restated expense is  $D(1 + I)$  as before.

## 2. Translation

Let  $I_d$  be the domestic, i.e. US, inflation rate, and  $I_f$  be the foreign inflation rate. Then  $i_d$  and  $i_f$  are the corresponding apparent inflation rates defined in 1 above applicable to revenues and expenses in the domestic and foreign unit respectively.

In the absence of inflation, the translated depreciation expense =  $\$ DS_0$ , which is by definition numerically equal to the depreciation expense of the US entity.

If PPP holds and there is foreign inflation but no domestic inflation, the average exchange rate is  $S_0/(1 + i_f)$ . Under foreign HC accounting, the depreciation expense is  $D$ , but is translated to  $\$ D.S_0/(1 + i_f)$ .

Since the corresponding domestic expense is  $\$ D.S_0$ , the effect of the translation process is to understate the expense by a factor  $1/(1 + i_f)$ , and therefore to overstate foreign income.

In the general case of inflation in both countries, the average exchange rate applicable to the translation of revenue items is

$$S_0(1 + i_d)/(1 + i_f)$$
so that the translated expense becomes

$$\$ D.S_0(1 + i_d)/(1 + i_f)$$
which would typically, but erroneously be compared to the corresponding domestic item  $\$ DS_0$ , thereby

understating foreign income relative to US HC income if  $i_d > i_f$

overstating foreign income relative to US HC income if  $i_d < i_f$

Consider now the case where full inflation adjustments are incorporated. The inflation adjustment is in two parts:

i. Recording the expense at the time it is incurred at the then-current purchasing power.

ii. Restating the expense at the end of the year into units of year-end



purchasing power.

The implication behind using an average exchange rate for translation of foreign income is that at the time the foreign revenue is recognised, it is measured after adjusting for foreign inflation. At this point in time, it is implicitly recognised as dollar revenue, so that on any subsequent date, that dollar-denominated revenue should be restated to reflect the changed purchasing power of its dollar numeraire.

Consider first the simpler case where the only inflation is overseas. The current cost expense in foreign currency is

$$D(1 + i_f),$$

which translated at the average exchange rate  $S_o/(1 + i_f)$  becomes  $\$ D.S_o$ , which is exactly analogous to the US expense. Since there is no domestic inflation, this is also the expense in year-end purchasing power.

In the more general case, the average exchange rate, as before, is

$$S_o(1 + i_d)/(1 + i_f).$$

The foreign inflation-adjusted expense is  $D(1 + i_f)$ , which translates to  $\$ D.S_o(1 + i_d)$ , which is once again exactly the same as the domestic depreciation expense.

The adjustment factor to convert expenses to year-end purchasing power is  $(1 + i_d)$ , so in year-end purchasing power, this becomes

$$\$ D.S_o(1 + i_d)^2 \text{ which equals } \$ D.S_o(1 + I_d).$$

Thus HC always understates the expense and overstates income relative to real income, since

$$(1 + i_d)/(1 + i_f) < (1 + I_d) \text{ for all } i_d \text{ and } i_f > 0.$$

Finally, since the direction of adjustment for COGS is the same as the depreciation, but to a lesser degree, analogous reasoning and a similar result applies.

## APPENDIX B

Using the terminology of Appendix A, the book value of foreign assets at the start of the year in local currency is  $A$ , and in dollars  $\$A.S_0$ . Excluding the current year depreciation charge, the book value restated for local inflation at the end of the year is  $A(1 + I_f)$ .

The end of year exchange rate (PPP holds) is

$$S_0(1 + I_d)/(1 + I_f)$$

which gives a translated book value

$$\$ A(1 + I_f) \times S_0(1 + I_d)/(1 + I_f) = \$ A.S_0(1 + I_d)$$

which is the restated book value of the corresponding US asset in year-end US purchasing power.



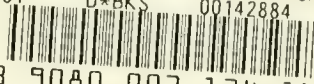




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